LINEAR PREDICTIVE CODING (LPC) ANALYSIS AND SYNTHESIS OF SPEECH USING MATLAB

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ABSTRACT

The speech analysis and synthesis have many applications and is essential especially in transmission of signals due to its bandwidth availability. In this project, a Linear Predictive Coding (LPC) method is utilized to analyze and store the speech parameters and synthesis the production of speech by using the stored speech parameters. Two female speaker speech samples parameters were analyzed based on Voice Activity Detection (VAD), formant frequency estimation, and fundamental frequencies analysis. Also being analyzed are the spectrogram and also the resulting synthetized speech. The synthesis part is to reconstruct the original speech sample based on the LPC coefficients, the pitch and other parameters encoded by the LPC system. And later on quality assessment was performed on the synthesized speech where Signal-To-Noise Ratio (SNR) and the predicted Mean Opinion Score (MOS) based on Perceptual Evaluation of Speech Quality (PESQ) method were determined. All of these were accomplished in the MATLAB software environment.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

Communication is an essential part of human life. It is well known that speech plays a key role in communication where speech is widely used universally for us to communicate with each other easily. Speech is the vocalized form of human communication. It is based upon the syntactic combination of word and names that are drawn from very large vocabularies. Due to the increasing demand for speech communication, speech processing technology has received increasing levels of interest from the research, standardization, and business communities. Speech processing will be applied in this project mainly to determine the features and characteristics of the speech sample and also the quality of the synthesized speech. Speech processing is the study of speech signals and the processing methods of these signals. The signals are usually processed in a digital representation, so speech processing can be regarded as a special case of digital signal processing, applied to speech signal.